REMARKS

[0001]   Applicant respectfully requests reconsideration and allowance of all of the claims of the application. Claims 1-5, 7-8, 10-15, 19-21, 25-28, 30-31, 33, 35-37, and 40-43 are presently pending. Claims 1, 10, 19, 26, 31, 33, 35 and 37 are amended herein. Claims 9, 17-18, 23-24, 39 and 44-48 are cancelled herein. No new claims are added herein.

Formal Request for an Interview

[0002]   If the Examiner's reply to this communication is anything other than allowance of all pending claims, then I formally request an interview with the Examiner. I encourage the Examiner to call me—the undersigned representative for the Applicant—so that we can discuss this matter so as to resolve any outstanding issues quickly and efficiently over the phone.

[0003]   Please contact me or my assistant to schedule a date and time for a telephone interview that is most convenient for both of us. While email works great for us, I welcome your call to either of us as well. Our contact information may be found on the last page of this response.

Claim Amendments

[0004]   Without conceding the propriety of the rejections herein and in the interest of expediting prosecution, Applicant amends claims 1, 10, 19, 26, 31, 33, 35 and 37 herein. Applicant amends claims to clarify claimed features. Such amendments are made to expedite prosecution and to more quickly identify allowable subject matter. Such amendments are merely intended to clarify the

claimed features, and should not be construed as further limiting the claimed invention in response to the cited references.
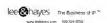
Formal Matters

[0005]   This section addresses any formal matters (e.g., objections) raised by the Examiner.

Specification

[0006]   The Examiner objects to the specification for failing to provide proper antecedent basis for the claimed subject matter.   Specifically the Examiner objects to the inclusion of the term ".NET framework" in claim 28 and the term "Common Language Runtime (CLR)" in claim 43.   Herein, Applicant amends the specification, as shown above, to correct the informalities noted by the Examiner.

[0007]   The Examiner objects to the specification for including a blank space in the first paragraph of the instant application.   Herein, Applicant amends the specification, as shown above, to correct the informalities noted by the Examiner.

[0008]   The Examiner objects to the specification for failing to provide proper antecedent basis for the claimed subject matter.   Specifically the Examiner objects to the inclusion of the term "physical" in claims 10, 19, 26 and 37.   Herein, Applicant amends the specification, as shown above, to correct the informalities noted by the Examiner.   Support for the amendments can be found at least at page 26 of the instant specification

Drawings

[0009]   The Examiner objects to Figures 1 and 6 for issues regarding consistent use of reference numbers on within the drawings and the specification. Herewith, Applicant submits replacement drawings to correct the informalities noted by the Examiner. Additionally, Applicant has amended the specification to rectify any unintentional inconsistencies. Applicant respectfully requests the withdrawal of the objections raised with regard to the drawings.

Claims

[0010]   The Examiner objects to claims 33 and 35 for depending from a previously cancelled claim. Herein, Applicant amends these claims, as shown above, to correct the informalities noted by the Examiner. Specifically, these claims have been amended to correctly depend from claim 31.

Substantive Matters

Claim Rejections under §103

[0011]   Claims 1-4, 7-15, 17-18, 37, 39 and 41 presently stand rejected under 35 U.S.C. §103(a) as being unpatentable over NPL "Matching Events in a Content-based Subscription System" credited to Aguilera in view of NPL "Dynamic Query Evaluation Plans" credited to Graefe.

[0012]   Claims 5, 19-21, 23-28, 30-31, 35-36, 40, and 42-48 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Aguilera in view of Graefe and in further view of NPL excerpts from "Java Platform Std. Ed. V1.4.2" hereinafter referred to as Java API.

[0013]   In light of the amendments presented, Applicant submits that these rejections are moot. Accordingly, Applicant asks the Examiner to withdraw these rejections.

[0014]   The Examiner's rejections are based upon the following references in various combinations:

- **Aguilera:** *Aguilera, et al., "Matching Events in a Content-based Subscription System", ACM, 1999, pp 18*;
- **Graefe:** *Graefe, et al., "Dynamic Query Evaluation Plans", ACM, 1989, pp 358-366*; and
- **Java API:** *"Interface Node", at <<http://java.sun.com/j2se/1.4.2/docs/api/org/w3c/dom/Node.html >>, Java 2 Platform Std. Ed., v1.4.2, 2007, pp 14*

Obviousness Rejections

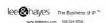## Lack of *Prima Facie* Case of Obviousness (MPEP § 2142)

[0015]   Applicant respectfully disagrees with the Examiner's obviousness rejections, but in an attempt to advance prosecution, Applicant has amended the claims to more distinctly distinguish the claims from the cited art. Arguments presented herein point to various aspects of the record to demonstrate that all of the criteria set forth for making a prima facie case has not been met for the claims as presently amended.

Independent Claim 1

[0016]   Applicant submits that combination of Aguilera and Graefe does not render claim 1 obvious because the cited combination does not teach the following features as recited in this claim (with emphasis added):

- "implementing an optimized branch node that includes an optimized indexed lookup procedure, wherein **the optimized lookup procedure comprises an interval tree function to optimize numeric interval queries**" and
- "**restoring the optimized branch node to a generic branch node** when the optimized branch node is no longer more efficient than the generic branch code"

[0017]   The Examiner indicates (Action, p. 7) in rejecting dependent claim 9 the following with regard to the first emphasized claim feature:

As per claim 9, **Aguilera et al.** as modified, does not explicitly disclose the indexed lookup routine further comprising one of the following routines: a hash routine; a routine that uses tries; an interval tree routine. However, as **Aguilera et al.** is silent as to which indexing method to use, it would obvious to one of ordinary skill to choose an efficient indexing method based on the attribute in question, which includes a hash routine; a routine that [or], an interval tree routine. For instance, see **Graefe et al.** on page 360 "using a hash index".

[0018] The combination of Aguilera and Graefe is silent as to "the optimized lookup procedure compris[ing] an interval tree function to optimize numeric interval queries". The Examiner points to Graefe as teaching an interval tree routing, but upon reviewing Graefe, Applicant is unable to ascertain where Graefe might teach the aforementioned function. More importantly, Graefe clearly does not explicitly or implicitly teach an "interval tree function to optimize numeric interval queries".

[0019] Further, the Examiner indicates (Action, p. 11) in rejecting dependent claim 18 the following with regard to the second emphasized claim element:

As per claim 18, **Aguilera et al.** as modified, implicitly has the property that the opcode merger is further configured to restore an optimized branch node to a generic branch node when the optimized branch node is no longer more efficient that the generic branch node (last paragraph of section 5, lines 4-6). The choose-plan is evaluated each time, and causes the most efficient query evaluation technique to be used. If this is the usual sequential method, then it does so.
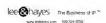
[0020]   The cited portion of Graefe states:

> It can be argued that setting up the bindings dynamically inflicts too much overhead on query processing. Consider the example of a banking teller transaction introduced in Section 3. If there is no gain in using a dynamic access module, the decision tree can be an empty function. In this case, all bindings must be set statically, and "evaluating" the decision tree costs only one instruction. The techniques proposed here do not require that as many choices as possible must be delayed until run time. Their advantage is that they allow delaying exactly as many choices as advisable.

[0021]   Graefe is silent as to "restoring the optimized branch node to a generic branch node when the optimized branch node is no longer more efficient than the generic branch code". Instead Graefe teaches "If there is no gain in using a dynamic access **module**, the decision tree can be an empty function". (emphasis added for clarity, last paragraph of section 5, lines 4-6). Graefe teaches that "if the bindings dynamically inflict too much overhead on query processing" then the originally optimized designed queries are used. (See sections 1 and 5 of Graefe) Graefe does not teach that the "optimized branch node" is restored to "a generic branch code".

[0022]   Additionally, Graefe teaches that the entire module is changed to a different optimized module. Graefe does not teach that a specific "optimized

branch node" is restored "to a generic branch node when the **optimized branch node** is no longer more efficient than the generic branch node". The present application does not look at the system efficiency to determine a change in system but instead looks at the efficiency of specific nodes.

[0023]   As shown above, the combination of Aguilera and Graefe does not teach or render obvious all of the elements and features of this claim. Accordingly, Applicant asks the Examiner to withdraw the rejection of this claim.

Dependent Claims 2-5 and 7-8

[0024]   These claims ultimately depend upon independent claim 1.   As discussed above, claim 1 is allowable.   It is axiomatic that any dependent claim which depends from an allowable base claim is also allowable.   Additionally, some or all of these claims may also be allowable for additional independent reasons.

Independent Claim 10

[0025]   Applicant submits that combination of Aguilera and Graefe does not render claim 10 obvious because the cited combination does not teach the following features as recited in this claim (with emphasis added):

> implementing an optimized branch node that includes an optimized
> indexed lookup procedure if such implementation would increase
> branch processing efficiency and referencing the opcode node from
> the optimized branch node, wherein:

> the optimized indexed lookup procedure further comprises an interval tree function to optimize numeric interval queries;

> the opcode merger is further **configured to restore an optimized branch node to a generic branch node when the optimized branch node is no longer more efficient that the generic branch node.**

[0026]   As discussed previously with regard to independent claim 1, the combination of cited art fails to teach or suggest "the optimized indexed lookup procedure further comprises an interval tree function to optimize numeric interval queries" and restoring "an optimized branch node to a generic branch node when the optimized branch node is no longer more efficient that the generic branch node". Independent claim 10 has been amended to include these features. Independent claim 10 is at least allowable for including these features, as these features are not taught or suggested, as explained with reference to independent claim 1.

[0027]   As shown above, the combination of Aguilera and Graefe does not disclose, teach, or suggest all of the elements and features of this claim. Accordingly, Applicant asks the Examiner to withdraw the rejection of this claim.

Dependent Claims 11-15

[0028]   These claims ultimately depend upon independent claim 10. As discussed above, claim 10 is allowable. It is axiomatic that any dependent claim

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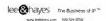Atty Docket No.: MS1-2021US
Atty/Agent: Jason F. Lindh
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lee&hayes   The Business of IP ™
www.leehayes.com   509 324 9256

which depends from an allowable base claim is also allowable. Additionally, some or all of these claims may also be allowable for additional independent reasons.

Independent Claim 19

[0029]   Applicant submits that combination of Aguilera and Graefe does not render claim 19 obvious because the cited combination does not teach the following features as recited in this claim (with emphasis added):

- **the optimized lookup procedure comprises an interval tree function to optimize numeric interval queries**; and

- **<u>restoring the optimized branch node to a generic branch node when the optimized branch node is no longer more efficient than the generic branch code</u>**

[0030]   As discussed previously with regard to independent claim 1, the combination of cited art fails to teach or suggest "the optimized lookup procedure comprises an interval tree function to optimize numeric interval queries" and "restoring the optimized branch node to a generic branch node when the optimized branch node is no longer more efficient than the generic branch code". Independent claim 19 has been amended to include these features. Independent claim 19 is at least allowable for including these features, as these features are not taught or suggested, as explained with reference to independent claim 1.

[0031]   As shown above, the combination of Aguilera and Graefe does not disclose, teach, or suggest all of the features and features of this claim. Accordingly, Applicant asks the Examiner to withdraw the rejection of this claim.

Dependent Claims 20-21and 25

[0032]   These claims ultimately depend upon independent claim 19.   As discussed above, claim 19 is allowable.   It is axiomatic that any dependent claim which depends from an allowable base claim is also allowable.   Additionally, some or all of these claims may also be allowable for additional independent reasons.

Independent Claim 26

[0033]   Applicant submits that combination of Aguilera and Graefe does not render claim 26 obvious because the cited combination does not teach the following features as recited in this claim (with emphasis added):

- **the optimized lookup procedure comprises an interval tree function to optimize numeric interval queries**; and

- <u>**restoring the optimized branch node to a generic branch node when the optimized branch node is no longer more efficient than the generic branch code**</u>

[0034]   As discussed previously with regard to independent claim 1, the combination of cited art fails to teach or suggest "the optimized lookup procedure comprises an interval tree function to optimize numeric interval queries" and "restoring the optimized branch node to a generic branch node

when the optimized branch node is no longer more efficient than the generic branch code". Independent claim 26 has been amended to include these features. Independent claim 26 is at least allowable for including these features, as these features are not taught or suggested, as explained with reference to independent claim 1.

[0035]   As shown above, the combination of Aguilera and Graefe does not teach or render obvious all of the features and features of this claim. Accordingly, Applicant asks the Examiner to withdraw the rejection of this claim.

Dependent Claims 27-28 and 30

[0036]   These claims ultimately depend upon independent claim 26. As discussed above, claim 26 is allowable. It is axiomatic that any dependent claim which depends from an allowable base claim is also allowable. Additionally, some or all of these claims may also be allowable for additional independent reasons.

Independent Claim 31

[0037]   Applicant submits that combination of Aguilera and Graefe does not render claim 31 obvious because the cited combination does not teach the following features as recited in this claim (with emphasis added):

- wherein the modifying further comprises removing an optimized lookup function that includes an indexed lookup routine from the branch node if removing the branch node renders the lookup function less efficient than a direct comparison function, wherein **the optimized lookup procedure**

comprises an interval tree function to optimize numeric interval queries

[0038]   As discussed previously with regard to independent claim 1, the combination of cited art fails to teach or suggest "the optimized lookup procedure comprises an interval tree function to optimize numeric interval queries". Independent claim 31 has been amended to include these features. Independent claim 31 is at least allowable for including these features, as these features are not taught or suggested, as explained with reference to independent claim 1.

Dependent Claims 33 and 35-36

[0039]   These claims ultimately depend upon independent claim 31. As discussed above, claim 31 is allowable. It is axiomatic that any dependent claim which depends from an allowable base claim is also allowable. Additionally, some or all of these claims may also be allowable for additional independent reasons.

Independent Claim 37

[0040]   Applicant submits that combination of Aguilera and Graefe does not render claim 37 obvious because the cited combination does not teach the following features as recited in this claim (with emphasis added):

- the modifying step further comprises modifying the branch node to include an indexed lookup function if the dependent opcode nodes perform a similar function and processing the dependent opcode with the indexed

lookup function increases the efficiency thereof, wherein **the optimized lookup procedure comprises an interval tree function to optimize numeric interval queries**

[0041]   As discussed previously with regard to independent claim 1, the combination of cited art fails to teach or suggest "the optimized lookup procedure comprises an interval tree function to optimize numeric interval queries". Independent claim 37 has been amended to include these features. Independent claim 37 is at least allowable for including these features, as these features are not taught or suggested, as explained with reference to independent claim 1.

Dependent Claims 40-43

[0042]   These claims ultimately depend upon independent claim 31.   7s discussed above, claim 37 is allowable.   It is axiomatic that any dependent claim which depends from an allowable base claim is also allowable.   Additionally, some or all of these claims may also be allowable for additional independent reasons.

Dependent Claims

[0043]   In addition to its own merits, each dependent claim is allowable for the same reasons that its base claim is allowable. Applicant requests that the Examiner withdraw the rejection of each dependent claim where its base claim is allowable.

Conclusion

[0044]   All pending claims are in condition for allowance. Applicant respectfully requests reconsideration and prompt issuance of the application.   If any issues remain that prevent issuance of this application, the **Examiner is urged to contact me before issuing a subsequent Action**.   Please call or email me or my assistant at your convenience.

Respectfully Submitted,

Lee & Hayes, PLLC
Representatives for Applicant

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